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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/081,626	02/20/2002	Masahiko Igaki	1232-4822	1949

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EXAMINER

PHAM, HOA Q

ART UNIT PAPER NUMBER

2877

DATE MAILED: 03/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/081,626	<b>Applicant(s)</b> IGAKI ET AL.	
	<b>Examiner</b> Hoa Q. Pham	<b>Art Unit</b> 2877	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 2/20/02 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |  |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)            |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date ____ | 6) <input type="checkbox"/> Other: ____  |

## **DETAILED ACTION**

### ***Priority***

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### ***Drawings***

2. Drawings filed on 2/20/02 have been approved.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-3 are rejected under 35 U.S.C. 102(b) as being anticipated by Eselun (5,909,283).

Regarding claim 1, Eselun discloses an illumination system (10) which applied a divergent light beam (12) from a light emitting device (10) to the reflection scale (14) provided on a measurement object which relative moves; the reflection scale which guides the light beam applied by the illumination system to a direction different from the illumination system by at least two reflections; and light sensing device (20) which detects an amount of light beam reflected by the reflected scale (see figures 1, 3, and 3B or column 2, lines 38-61).

Regarding claims 2-3, Eselun teaches that the scale has straight grating lines 16 on its front surface and the light beam reflected into diffraction beams at each locations A, B, and C.

5. Claims 1-7 and 9-10 are rejected under 35 U.S.C. 102(b) as being anticipated by Kondo et al (5,534,693).

The claims are broadly read on the teachings of Kondo et al.

Regarding claims 1, 9, Kondo et al discloses an illumination system (1) which applied a divergent light beam ( $R_0, R_{0-1}, R_{0+1}$ ) from a light emitting device (1) to the reflection scale (10) provided on a measurement object which relative moves; the reflection scale which guides the light beam applied by the illumination system to a direction different from the illumination system by at least two reflections (10B); and light sensing device (2B, 2C) which detects an amount of light beam reflected by the reflected scale (see figures 5A, 5C, 7).

Regarding claims 2-3, see column 6 lines 34-47 for the wavefront –splitting light beams.

Regarding claims 4-5, 10, Kondo et al teaches that the reflection scale is a roof type reflection having a two V-grooves (10B) (see figures 5C and 7).

Regarding claims 6-7, column 5, lines 63-67, Kondo et al teaches that the grooves is made by depositing aluminum in a vacuum on the V-grooves.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 8, 11-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kondo et al.

Regarding claims 8-10, 13-18, and 21-26, Kondo et al does not explicitly teach that the scale has cylindrical surfaces on the light beam incident and exit surface sides. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use different shapes of the scale, for example, cylindrical surface, arc or ellipse. Since such a modification would have only involved a mere change in the shape of the component. A change in the shape is generally recognized as being within the level of ordinary skill in the art.

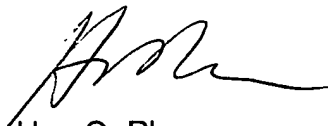
Regarding claims 11-12, 19-20, and 27-28; it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the basic device of Kondo et al to detect the displacement of different types of reflection scale, for example, reflection scale has a plurality of roof type reflective elements, each identical to the roof type reflection element, discontinuously array in a moving direction because the device would function in the same manner.

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Hikawa et al (5,057,686) discloses a displacement sensor, Ichikawa et al (4,983,825 and 5,204,524) discloses a reflective type encoder.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hoa Q. Pham whose telephone number is (571) 272-2426. The examiner can normally be reached on 7:30AM to 6 PM, Monday through Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G. Font can be reached on (571) 272-2415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Hoa Q. Pham  
Primary Examiner  
Art Unit 2877